

PATENT CLAIMS

1. A process for the laser beam machining, especially laser beam welding, of components (14), especially body parts, with a remote laser head (3), which is guided by a manipulator (5) with a multiaxial manipulator hand (7), characterized in that during welding or cutting the emitted laser beam (12) is guided along the welding path (19) on the component (14) by orientation modifications and with a variable irradiation angle β , where the changes in the orientation of the laser beam are generated only by pivoting motions of the manipulator hand (7) about at least one of the hand axes IV, V, VI thereof.

2. A process in accordance with claim 1, characterized in that the laser beam (12) emitted to the component (14) is not aligned with the last hand axis VI.

3. A process in accordance with claim 1 or 2, characterized in that the manipulator (5) is at rest during machining, welding or cutting with its other said axes I, II, III.

4. A process in accordance with claim 1, 2 or 3, characterized in that the focus (22) of the laser beam (12) is moved during welding or cutting on a shell path (20) about the intersection (9) of the hand axes IV, V, VI.

5. A process in accordance with one of the above claims, characterized in that the focus (22) of the laser beam (12) is adjusted in the direction of the beam during welding or cutting.

6. A process in accordance with one of the above claims, characterized in that the laser beam (12) is emitted from a remote laser head (3) arranged externally on the manipulator hand (7).

7. A process in accordance with one of the above claims, characterized in that the remote laser head (3) is guided by means of an extension arm (4) at a spaced location from the manipulator hand (7).

5 8. A process in accordance with one of the above claims, characterized in that the remote laser head (3) is held with an orientation in which the emitted laser beam (12) is directed at right angles to the last hand axis VI.

9. A process in accordance with one of the above claims, characterized in that the remote laser head (3) is attached directly to the manipulator hand (7) such that the emitted laser beam (12) intersects the intersection of the hand axes IV, V, VI.

10 10. A process in accordance with one of the above claims, characterized in that a remote laser head (3) with a rigid-angle focusing optical system (21) is used.

11. A process in accordance with one of the above claims, characterized in that a remote laser head (3) with a fixed focal length of preferably 500 mm to 1,500 mm is used.

15 12. A process in accordance with one of the above claims, characterized in that the laser output is adjusted during welding as a function of the changes in the orientation of the laser beam (12).

13. A process in accordance with one of the above claims, characterized in that the velocity of welding is adjusted during welding or cutting as a function of the irradiation angles β of the laser beam (12).